

## P. ENT COOPERATION TREA

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 24 November 1999 (24.11.99)	
International application No. PCT/GB99/00737	Applicant's or agent's file reference 57.0272WOPCT
International filing date (day/month/year) 22 March 1999 (22.03.99)	Priority date (day/month/year) 20 March 1998 (20.03.98)
Applicant JONES, Timothy, Gareth, John et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

18 October 1999 (18.10.99)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Marc Salzman

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## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



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Applicant's or agent's file reference 57.0272WOPCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/00737	International filing date (day/month/year) 22/03/1999	Priority date (day/month/year) 20/03/1998
International Patent Classification (IPC) or national classification and IPC E21B43/02		
Applicant SOFITECH N.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand  18/10/1999	Date of completion of this report  19.06.2000
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  olde Scheper, B  Telephone No. +49 89 2399 2141 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/00737

## I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

### Description, pages:

1-8 as originally filed

### Claims, No.:

1-9 with telefax of 17/03/2000

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims	4,9
	No:	Claims	1-3,5-8
Inventive step (IS)	Yes:	Claims	4,9
	No:	Claims	1-3,5-8
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/00737

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**2. Citations and explanations**

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

Ad Item V:

Reference is made to the following documents:

D1: US-A-4702319  
D2: US-A-4814096  
D3: US-A-4856588  
D4: US-A-5080809  
D5: US-A-5382371  
D6: US-A-5597783  
D7: US-A-5161615

1. Present claim 1 relates to a compound for selectively blocking water bearing subterranean formations. The applicant is advised that any compound which is in fact suitable for the state use would deprive the claim of novelty (PCT Guidelines, III, 4.8).

The applicant is further advised that the feature "...said composition forming a cross-linked gel in a subterranean water-bearing formation" used in the independent claim 1 is a functional feature (PCT Guidelines C-III, 4.7). Said feature is only restrictive in the fact that the composition must exhibit said capability.

It should be noted that the claims on file relate to a composition comprising a not-cross-linked modified polymer.

2. The present application, in so far as claims 1-3, 5-8 are concerned, is anticipated under Art. 33(2) and/or 33(3) PCT by the prior art documents D1-D7 (See international Search Report).

Water-soluble polymers having hydrophobic side groups are well known in the art, as recognised in the present application (see page 3, lines 8-9 and page 6, lines 9-10). Due to the very broad definitions of the said claims 1-3, 5-8, as chosen by the applicant, no distinguishing features in view of the available prior art can be established.

3. D1 discloses (see claims 1-10, examples 1-18, 44) a polymer having a low amount of hydrophobic side groups. Said polymer is made up the same monomers as disclosed in the present application (see pages 6-8).
4. The same applies to  
D2, see claims 1-14, examples 1-10  
D3, see column 4, lines 16-33; column 5, lines 1-23; claims 1-23; examples 1-6,  
D4, see column 16, line 61 to column 17, line 26; claims 1, 74, 75, Table XXIV,  
D5, see column 9, lines 23-27; column 16, line 61 to column 17, line 26; claims  
1, 17, 30, Table XXIV, XXX  
D6, see column 1, lines 17-52; claims 1-24

Document D7 discloses aldehydes as cross-linking agents.

5. The subject-matter of present claims 1-3 and 5-8 lacks novelty in view of the above identified disclosures (Art. 33(2) PCT).
6. It appears that present claims 4 and 9 meet the requirements of Art. 33(2) and (3) PCT in view of the available prior art.

None of the available prior art documents disclose cross-linkable polymers having functional groups for cross-linking, which functional groups form part of the hydrophilic side-groups.

None of the available prior art documents disclose a composition wherein the chemical cross-linking agent is hexanal or heptanal.

Since each of both differences is not suggested by the available prior art documents, an inventive step may be recognised (Art. 33(3) PCT).

8. The present application satisfies the criterion set forth in Article 33 (4) PCT because the subject matter of claims 1-9 is industrially applicable.
9. It appears that if the present application were restricted to the subject-matter of claims 4 and 9, such a restricted application might lack a common inventive concept (Rule 13 PCT).

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB99/00737

Ad Item VIII:

1. The description is not in conformity with the claims as required by Rule 5.1(a)(iii) PCT.

Rec'd on 20 Sept 1960

1. A compound for selectively blocking water bearing subterranean formations, said compound being a hydrophobically modified water soluble polymer capable of being chemically cross-linked so as to produce a stable gel for blocking a water-bearing formation from a hydrocarbon-producing well, wherein said polymer is essentially linear, thus defining a polymeric backbone, and hydrophobic groups are located at random positions along the backbone.
2. The compound of claim 1, comprising 0.5 to 5 mole per cent of a hydrophobic monomer.
3. The compound of claim 1, comprising functional groups capable of being chemically cross-linked, said groups being part of a hydrophilic section of the polymer.
4. The compound of claim 1, comprising functional groups capable of being chemically cross-linked, said groups being part of a hydrophobic section of the polymer.
5. The compound of claim 1, having a molecular weight of 50,000 or more.
6. A composition for selectively blocking water bearing formations from a hydrocarbon producing well comprising a compound in accordance with claim 1 and a chemical cross-linking agent.
7. The composition of claim 6, wherein the chemical cross-linking agent is organic.



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8. The composition of claim 6, wherein the chemical cross-linking agent is an aldehyde or aldehyde derivative comprising at least 5 carbon atoms.
- 5 9. The composition of claim 6, wherein the chemical cross-linking agent is hexanal or heptanal.

**INTERNATIONAL COOPERATION TREATY**

**PCT**

**INTERNATIONAL SEARCH REPORT**

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>57.0272W0PCT</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 99/ 00737</b>	International filing date (day/month/year) <b>22/03/1999</b>	(Earliest) Priority Date (day/month/year) <b>20/03/1998</b>
Applicant  <b>SOFITECH N.V. et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☒ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

GB 99/00737

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 E21B43/02 C09K7/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 E21B C09K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 702 319 A (BOCK JAN ET AL) 27 October 1987 see claims 1-10; examples 1-18,44	1-5
Y		6-8
A	see the whole document ---	9
X	US 4 814 096 A (EVANI SYAMALARAO) 21 March 1989 see claims 1-14; examples 1-10	1-5
Y		6-8
A	see the whole document ---	9
	-/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## ° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

25 June 1999

Date of mailing of the international search report

06/07/1999

Name and mailing address of the ISA

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Authorized officer

olde Scheper, B

## INTERNATIONAL SEARCH REPORT

International Application No.

GB 99/00737

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 856 588 A (BORCHARDT JOHN K) 15 August 1989 see column 4, line 16 - line 33 see column 5, line 1 - line 23; claims 1-22; examples 1-6	1-5
Y		6-8
A	see the whole document ---	9
X	US 5 080 809 A (STAHL G ALLAN ET AL) 14 January 1992 see column 16, line 61 - column 17, line 26; claims 1,74,75; table XXIV	1-5
Y		6-8
A	see the whole document ---	9
X	US 5 382 371 A (STAHL G ALLAN ET AL) 17 January 1995 see column 9, line 23-27 see column 16, line 61 - column 17, line 26; claims 1,17,30; tables XXIV,XXX	1-5
Y		6-8
A	see the whole document ---	9
X	US 5 597 783 A (AUDIBERT ANNIE ET AL) 28 January 1997 see column 1, line 17 - line 52; claims 1-24	1-5
Y		6-8
A	see the whole document ---	9
Y	US 5 161 615 A (HUTCHINS RICHARD D ET AL) 10 November 1992 see column 1, line 36 - column 2, line 44; claims 36,37 see column 3, line 32 - line 39	6-8
A	see the whole document -----	9

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

GB 99/00737

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4702319	A	27-10-1987	GB 2199354 A,B	06-07-1988
			GB 2233692 A,B	16-01-1991
			NO 176490 B	02-01-1995
US 4814096	A	21-03-1989	US 4432881 A	21-02-1984
			AU 553081 B	03-07-1986
			AU 7990682 A	12-08-1982
			BR 8200657 A	14-12-1982
			CA 1171188 A	17-07-1984
			EG 15906 A	30-04-1987
			EP 0057875 A	18-08-1982
			IN 156183 A	01-06-1985
			JP 1577040 C	24-08-1990
			JP 2003435 B	23-01-1990
			JP 57155280 A	25-09-1982
			OA 7011 A	31-03-1983
			PH 20903 A	27-05-1987
			ZA 8200686 A	28-09-1983
US 4856588	A	15-08-1989	GB 2218720 A,B	22-11-1989
			NO 177198 B	24-04-1995
US 5080809	A	14-01-1992	US 4644020 A	17-02-1987
			US 4951921 A	28-08-1990
			US 5326854 A	05-07-1994
			US 5382371 A	17-01-1995
			AU 553817 B	31-07-1986
			AU 2372384 A	02-08-1984
			CA 1254026 A	16-05-1989
			DE 3486230 D	25-11-1993
			DE 3486230 T	17-02-1994
			DK 39684 A	29-07-1984
			EP 0115836 A	15-08-1984
			FI 840341 A	29-07-1984
			PT 78028 A,B	01-02-1984
			TR 22394 A	01-03-1990
			US 5186257 A	16-02-1993
			YU 13984 A	31-12-1986
US 5382371	A	17-01-1995	US 5186257 A	16-02-1993
			US 5080809 A	14-01-1992
			US 4951921 A	28-08-1990
			US 4644020 A	17-02-1987
			US 5326854 A	05-07-1994
			AU 553817 B	31-07-1986
			AU 2372384 A	02-08-1984
			CA 1254026 A	16-05-1989
			DE 3486230 D	25-11-1993
			DE 3486230 T	17-02-1994
			DK 39684 A	29-07-1984
			EP 0115836 A	15-08-1984
			FI 840341 A	29-07-1984
			PT 78028 A,B	01-02-1984
			TR 22394 A	01-03-1993
			YU 13984 A	31-12-1990
US 5597783	A	28-01-1997	FR 2719600 A	10-11-1995
			CA 2148558 A	05-11-1995

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

GB 99/00737

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5597783 A		DE 69506163 D	07-01-1999
		DE 69506163 T	15-04-1999
		EP 0681016 A	08-11-1995
		NO 951722 A	06-11-1995
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US 5161615 A	10-11-1992	NONE	
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